

Remarks/Arguments:

Claims 1-10 are pending and stand rejected.

By this amendment, claims 2 and 3 are amended, new claims 11-14 are added and claims 1 and 6 are cancelled without prejudice. No new matter is added by the claim amendments and new claims. Support for the claim amendments can be found throughout the original specification, and more particularly, in original claim 1, Figures 4A and 4B, and the associated disclosures in the original specification at page 9, line 25, to page 11, line 4, and page 13, lines 10-15.

Rejection of Claims 1-4 and 7-9 under 35 USC § 103(a)

In the Office Action at page 2, claims 1-4 and 7-9 are rejected under 35 USC § 103(a) as being unpatentable over Sakai et al. (JP 05-116571)(hereinafter referred to as Sakai) in view of Yoshinari et al. (JP 8-094684) (hereafter referred to as Yoshinari).

Reconsideration is respectfully requested.

Claim 1

Claim 1 has been cancelled without prejudice. Accordingly the rejection of claim 1 is now moot.

Claim 2

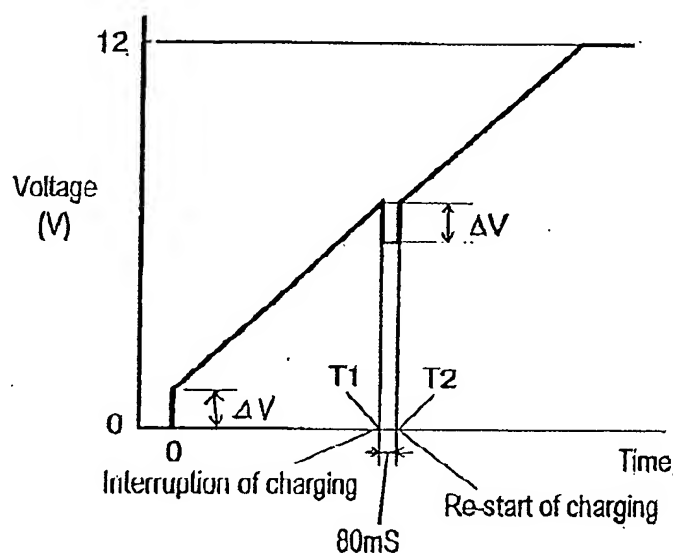
Claim 2 is directed to a power supply apparatus for a vehicle, and recites:

...the detection unit measures an internal resistance value of the capacitor unit based on a current value in the charging and a voltage increase when charging is started or based on the current value in the charging and one of a voltage decrease when the charging is interrupted and a voltage increase when the charging is restarted after the interruption, and the detection unit measures an internal capacitance value

of the capacitor unit from a rate of change of voltage per unit time of the capacitor unit in charging, and the detection unit detects an abnormality in the capacitor unit based on the measured internal resistance value and internal capacitance value.

That is, as shown in Fig. 4A, reproduced below, the detection unit measures an internal resistance value based on: (1) a voltage increase when charging is started; (2) a voltage decrease when charging is interrupted; or (3) a voltage increase when the charging is restarted after an interruption (the voltage increase/decrease being denoted by ΔV).

FIG. 4A



Sakai Abstract

The Sakai abstract, which is the only portion of Japanese JP 05-116571 having an English language translation, discloses a capacitor C of a large capacity is connected to a battery 1 via a constantly open relay R3 to start an engine. When the engine cannot be started, the capacitor 4 is charged and electricity is transmitted to the starter 3 using the electric charge as a capacitor 4 in addition to the battery power to start the engine and a dead display circuit 11 warns that the battery capacity is insufficient. See Sakai abstract. The Sakai abstract is silent regarding anything related to voltage increases and/or decreases of capacitor 4.

Yoshinari Reference

Yoshinari discloses charging and discharging of an electrolytic capacitor C with particular measurements taken at various times. The terminal voltage V_c during charging and a time interval from the start of the charging to when the terminal voltage V_c reaches a preset voltage is measured. The capacity value of the electrolytic capacitor C is calculated based on the period measured and a known series resistance (i.e., resistor 11). (See Yoshinari at paragraph [0024].). Further the charged electrolytic capacitor is discharged through current-limiting resistance 8 and the discharge current from the electrolytic capacitor is measured and the terminal voltage V_c of the electrolytic capacitor C under discharge is also measured. (See Yoshinari at paragraph [0032]) In Yoshinari, the equivalent series resistance value RESR is calculated based on these measurements. Yoshinari, however, is silent regarding a voltage increase when (e.g., at the time) charging is started, a voltage decrease when charging is interrupted or a voltage increase when charging is restarted after an interruption. This is because, Yoshinari teaches calculation of terminal voltage V_c and equivalent-series resistance based on changes in voltage levels over various time periods.

The cited art of Sakai and Yoshinari taken singularly, or in any proper combination, does not disclose or suggest the above mentioned features of claim 2.

Accordingly, claim 2 is submitted to patentably distinguish over the combination of Sakai and Yoshinari for at least the above-mentioned reasons.

Claim 3

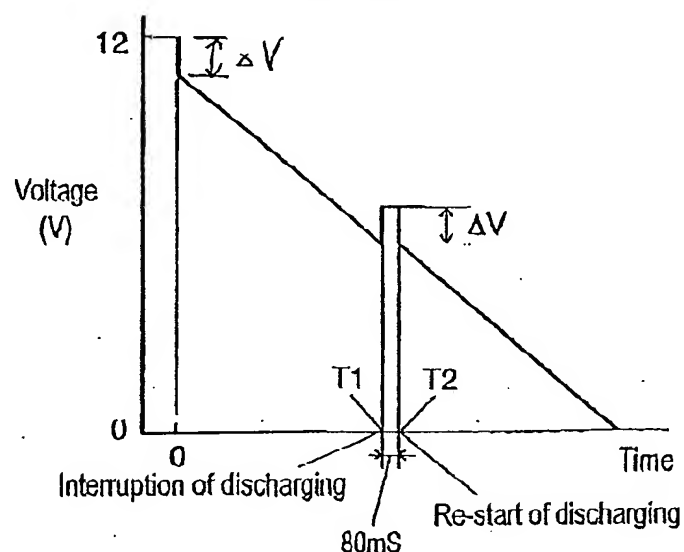
Claim 3 is directed to a power supply apparatus for a vehicle, and recites:

...the detection unit measures an internal resistance value of the capacitor unit based on a current value in the discharging and a voltage decrease when discharging is started, or based on the current value in the discharging and one of a voltage increase when the charging is interrupted and a voltage decrease when the discharging is restarted after the interruption, and the detection unit measures an internal capacitance value of the capacitor unit from a rate of change of voltage per unit time of the capacitor unit in discharging, and the detection unit detects an abnormality in the capacitor

unit based on the measured internal resistance value and internal capacitance value.

That is, as shown in Fig. 4B, reproduced below, the detection unit measures an internal resistance value based on: (1) a voltage decrease when discharging is started; (2) a voltage increase when discharging is interrupted; or (3) a voltage decrease when the discharging is restarted after an interruption (the voltage decrease/increase being denoted by ΔV).

FIG. 4B



It is submitted that claim 3 patentably distinguishes over the cited art of Sakai and Yoshinari for reasons similar to those of claim 2.

Claims 4, 7 and 9

Claims 4, 7 and 9, which include all the limitations of claim 2 from which they ultimately depend, are submitted to also patentably distinguish over the combination of Sakai and Yoshinari for at least the same reasons as claim 2.

Claim 8

Claim 8, which includes all the limitations of claim 3 from which it ultimately depends, is also submitted to patentably distinguish over the combination of Sakai and Yoshinari for at least the same reasons as claim 3.

Rejection of Claims 4-6 and 10 under 35 USC § 103(a)

In the Office Action at page 3, claims 4-6 and 10 are rejected under 35 USC § 103(a) as being unpatentable over Sakai and Yoshinari and further in view of Lew et al. (US Patent No. 5,627,325) (hereafter referred to as Lew).

Reconsideration is respectfully requested.

Claims 4-5 and 10, which include all the limitations of claim 2 or claim 3 from which they ultimately depend, are also submitted to patentably distinguish over Sakai and Yoshinari for at least the same reasons as claim 2 or claim 3.

In Lew a position of a target member is determined as a function of the measured phase angle of an electrical output. Lew, which is used by the Examiner to show temperature compensation, does not overcome the deficiencies of Sakai and Yoshinari. This is because, Lew does not disclose or suggest, for example, with respect to claim 2, and similarly with respect to claim 3, measuring an internal resistance value of the capacitor unit based on a voltage increase when charging is started, based on a voltage decrease when charging is interrupted and/or based on a voltage increase when charging is restarted after an interruption.

The cited art of Sakai, Yoshinari and Lew taken singularly, or in any proper combination does not disclose or suggest the above-mentioned features of claim 2 or claim 3.

Accordingly claims 4, 5 and 10 which include all the features of claim 2 or claim 3, are submitted to patentably distinguish over the combination of Sakai, Yoshinari and Lew for at least the same reasons as claim 2 or claim 3.

Moreover, claims 4 and 5 include patentable distinctions beyond those of claim 2 or claim 3. More particularly, Lew discloses the use of "an algorithm compensating for the effect of the temperature change on the measurement of position of the target member due to the temperature change." (See Lew at column 10, lines 48-51.) Lew, however, is silent regarding how such compensation occurs. Claim 4, as an example, recites that the detection unit "corrects the internal capacitance value and the internal resistance value at each temperature based on a capacitance value difference and a resistance value difference between

each of the measured internal capacitance values and the measured internal resistance values and each of a standard internal capacitance value and a standard internal resistance value of the capacitor unit which are initialized in advance, at a temperature measured in the charging.” Such features are not disclosed or suggested by Lew or the other cited references.

New Claims 11-14

New claims 11-14, which include all the limitations of claim 2 or claim 3 from which they ultimately depend, are also submitted to be allowable for the same reasons as set forth regarding claim 2 or claim 3.

Moreover, claims 11-14 also include patentable distinctions beyond those of claim 2 or claim 3. For example, claims 11 and 12 include the recitation that “the detection unit measures an internal capacitance value of the capacitor unit from a composite rate of change of voltage per unit time of the capacitor unit based on a plurality of different rates of change of voltage per unit time.” The cited art of Sakai, Yoshinari and Lew are silent regarding such features.

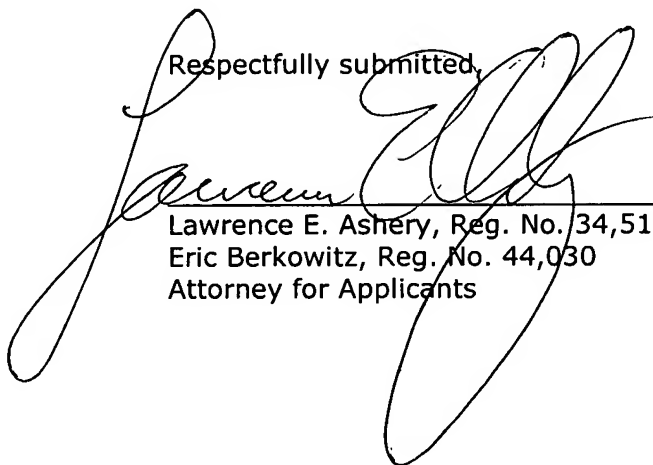
Application No.: 10/524,335
Amendment Dated: July 17, 2006
Reply to Office Action of: May 3, 2006

MAT-8666US

Conclusion

In view of the claim amendments and arguments set forth above, it is submitted that the application is in condition for allowance, an early action to this effect is respectfully requested.

Respectfully submitted,



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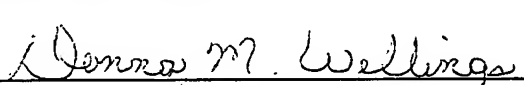
LEA/ds/dmw

Dated: July 17, 2006

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